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TRANSITRON OSCILLATORS

By Charles C. Quin, VK3WQ (Laboratory Committee.)

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Some of the following has been extracted from an article in MARCH 1944 ELECTRONICS, to which you are referred for further information.

Since Negative Resistance is mentioned, an explanation of its theory and practical operation is deemed necessary.

Normally, when coils and condensers are put together to form a tuned circuit, they are equivalent to a very high positive resistance at the frequency to which they are tuned. The lower the resistance due to losses in components, the higher is the so-called "Dynamic Resistance." Using efficient components it is possible to make it several hundred thousand ohms, whilst using poor components, that is poor power factor, it may be only tens of thousand ohms.

If there were no losses at all, the dynamic resistance would be infinity, but this can be achieved only by neutralising them by means of negative resistance, of which valve action is the most familiar example.

If this resonant circuit was completely free from losses, a current, once started, would continue indefinitely, that is, sustained oscillations would occur. Naturally this is impracticable, so this condition can be simulated in practice, by cancelling the actual resistance in the circuit by inserting an equal, or greater amount of negative resistance.

Negative resistance is exhibited by any device showing an increase of current when the applied voltage is decreased or vice versa.

The vacuum tube can be made to show negative resistance by a number of arrangements of electrode potentials.

For example, in a normal regenerative detector circuit, the

feedback energy from the plate to the grid circuit acts to neutralise the effect of the positive resistance, and negative resistance results.

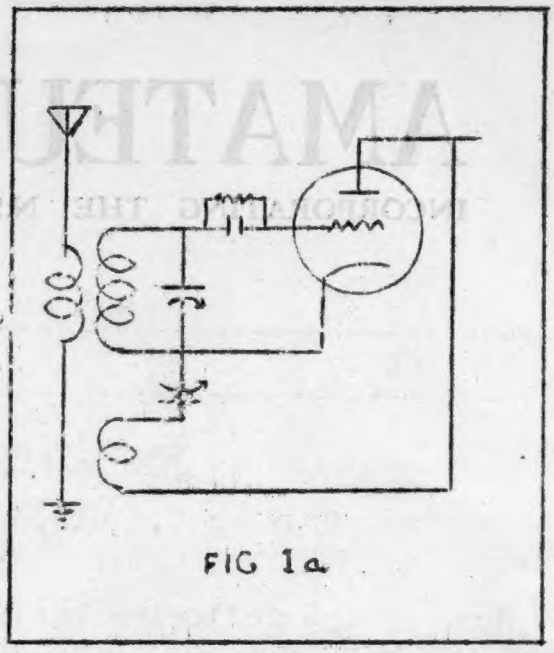


FIG 1a

In a normal tube, in a receiver, the speed of the electrons, from cathode to plate is such, that on striking the plate, some of them 'bounce' back and would return towards the cathode, if it were not for the slightly lower positive voltage applied to the screen, and in earlier type tubes such as the 24, where there was no suppressor, this increased the screen current. In later tubes such as the 57, right up to the 'modern' 6SK7 and others, where a suppressor grid is used, these electrons that 'bounce,' are repelled towards the plate again by virtue of the fact that a negative voltage is applied to this suppressor.

This 'bounce back' is known as SECONDARY EMISSION.

In the Dynatron Oscillator, this fact is made use of in that the screen is operated at a potential higher than that of the plate, and most of the electrons that pass through towards the plate and 'bounce back,' are then attracted by the screen.

The net result is that nearly all the electrons emitted by the cathode are attracted and retained by the screen. Now, if the plate voltage is gradually increased, a still smaller current is taken by the plate, owing to the neutralising effect at some critical point between the normal electron emission from the cathode, and the secondary emission from the plate. When this particular point is reached, the plate cathode circuit resistance would indicate a negative resistance characteristic, if an alternating current potential were applied to the circuit. It is this peculiarity which is the basis of the action of the dynatron oscillator.

In the dynatron, the amount of negative resistance depends on the valve itself, and not on external couplings or adjustments, as also in the transitron, where, by virtue of the fact that as the suppressor grid of a pentode is given more negative bias, electrons normally passing through to the plate, are turned back to the screen, thus increasing the screen current and reversing normal tube action.

The negative resistance so produced, is sufficiently low, that ordinary tuned circuits will oscillate readily at frequencies up to 15 Mc or so.

If you were asked whether - 10,000 ohms or - 100,000 ohms would be most effective for neutralising losses, the obvious answer would be - 100,000 ohms. But wait. 10,000 ohms represents much heavier losses than 100,000, therefore - 10,000 ohms must be a correspondingly more effective negative resistance to neutralise it. When calculating, one must use the rule for adding the resistances in parallel $\frac{R1 \times R2}{R1 + R2}$ by which a combination of + 10,000 and - 100,000 gives + 11,111 ohms which is only a slight improvement on the original 10,000.

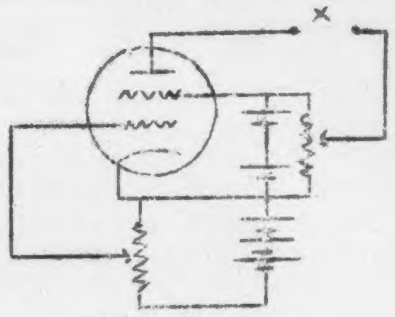


FIG 1 b

BASIC TEST DYNATRON CIRCUIT

The negative resistance of a dynatron, when it is given such a large negative bias as nearly to cut off its current, is nearly infinity, so only circuits already extremely low loss should be attempted. As the bias is reduced, the negative resistance falls, giving correspondingly greater neutralising ability, but one has to be careful not to allow the screen current to rise excessively or the valve will be damaged.

It is important then, to work with the grid bias just on the right side of the oscillation point. Any increases in the losses of the circuit necessitates reduced negative grid bias to bring the valve to oscillation point.

The bias voltage (taking care to keep all other working voltages constant), is therefore a measure of the circuit losses or resistance. Secondly, the frequency at which the circuit oscillates depends of course on the capacitance and inductance. Any change due to added connection necessitates retuning to restore the original frequency.

These two facts form the basis of substitution tests with the dynatron.

The transitron oscillator works on the principle of producing negative resistance between two grid circuits containing the frequency determining constants. As stated previously, negative resistance is produced between the plate and screen grid of a tetrode by dynatron action when secondary emission takes place.

Since dynatron secondary emission is not always reliable, due to variable factors in tube manufacture, that is, slight mechanical

differences effect electrical characteristics, and the oscillator resulting cannot always be relied upon for consistant results.

The transitron obtains its negative resistance characteristics in a different manner and so has the advantages of the dynatron without the attendant disadvantages. Stability of the circuit is excellent because only the RC values determine frequency, (at audio frequencies), the electrode voltages consequently having practically no effect whatever. Such a circuit is comparable to the crystal oscillator in stability since power supply variations of 25%, only change the frequency a few parts in a million.

The oscillator can be used throughout the audio range, and considerably above, using RC circuits alone. The upper practical limit with RC constants is approximately 0.5 Mc. Transitron circuits employing Inductance, can be operated with reliability to 20 Mc, and even to 60 Mc if careful design is observed. Operation above 20 Mc is somewhat difficult as regards efficiency and reliability.

The transitron can be made to oscillate at three distinct frequencies at the same time, by having LC circuits of different constants in its grid and cathode circuits. Thus the tube can operate at radio frequencies and be its own AF modulator.

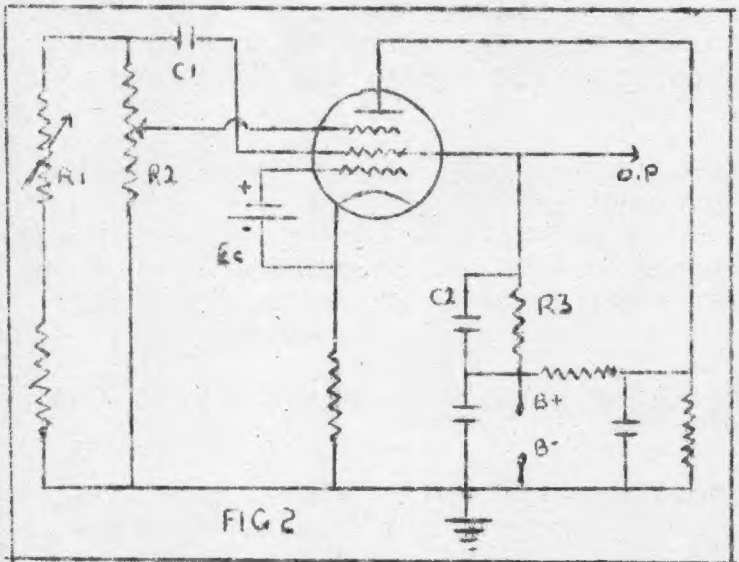


FIG 2

R1.Frequency Adjustment
R2.Feedback Adjustment
R3.Screen resonant circuit component
C1.Feedback Capacitor
C2.Screen resonant circuit component
Ec.Gris bias used to produce sine waves

This circuit therefore presents great potentialities for use with battery equipment in which constancy of calibration as the battery ages is important.

In this basic transitron circuit, the suppressor grid goes negative with respect to the cathode due to applied voltages. Electrons are attracted by the positive screen and repelled by the negative suppressor. A negative voltage change on the screen grid is transmitted from this grid to the suppressor through C1, causing the suppressor to repel more electrons, and resulting in a net increase in screen current. Such an increase with a negative increment in voltage, is effectively negative resistance between the screen and suppressor grids.

A typical negative resistance curve is given herewith - an AC fluctuation in screen voltage operates above and below point X. By this method an alternating current is produced which is 180 degrees out of phase with its initiating voltage.

Rn is the negative resistance portion of the screen characteristic, where an increase in screen voltage gives a decrease in screen current.

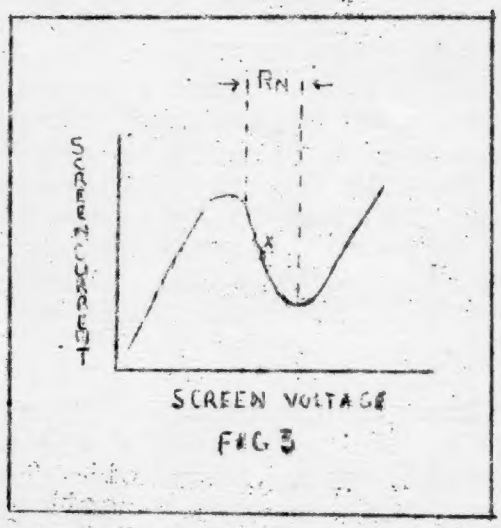


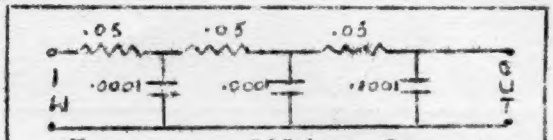
FIG 3

Any circuit whose output can supply all input losses by the creation of negative resistance can sustain continuous oscillations. By applying bias to the control grid, the total space current of the tube and the slope of the negative resistance curve can be controlled.

In this interval an increase in screen voltage will give a decrease, in screen current, and conversely. Sine-wave output of the oscillator is obtainable when the operation is confined to the linear portions of the Rn curve, that is, by supplying fixed bias to the suppressor and control grids, while properly adjusting the feedback. An alternative method consists of making the screen resistor a voltage divider, the centre arm of which is connected through a capacitor to the control grid. This system is useful in

direct sine-wave production when using proper bias on control and suppressor grids. Consequently, grid bias is used to produce sine waves and omitted to produce highly distorted waves.

SINE WAVES may be produced by operating the transitron to give an isosceles shape wave in the plate circuit and then to pass such a wave through a low-pass RC filter as shown in Figure 4. Such a combination may then be synchronised by the impression of a synchronised signal in the control grid circuit of the transitron. This produces synchronism not only in frequency but in phase as well, when periodically occurring pulses are used as a synchronising voltage.



Low pass filter for converting isoseles waves of 10 to 20 Kc to sine waves

SQUARE WAVES may be produced by proper feedback adjustment of the suppressor grid potentiometer as shown in Figure 2. The square wave output is taken from the screen circuit. Feedback adjustment controls the waveform together with the spacing between adjacent crests of the wave.

The transitron may be used as a source of PULSES by adjusting R2 so that a square wave derivitave is formed which produces a sharp peak over a small portion of the electrical cycle. When such a pulse is derived from a balanced square wave, negative pulses may be eliminated by rectification, while the pulses may be sharpened by passing them through voltage delay circuits. Both operations can be accomplished by using one biassed diode, see figure 5.

A SAW TOOTH WAVE may also be generated (See page 8 November 1944, AMATEUR RADIO). This wave form may be kept isosceles in shape over the range by making the cathode resistor variable. The wave form in the screen circuit is square wave or its derivitave type. The wave form in the plate circuit is saw tooth due to the large capacitance. To produce an isosceles shaped saw tooth wave, the capacitance must be large enough to employ only the linear portion of its charge characteristic. Varying the cathode (Inverse Feedback) resistor will vary the shape of the Sawtooth from Isosceles to other shapes.

Values of capacitance above those needed to correct the non-linear slope of the saw-tooth waveshape merely reduce the voltage output of the oscillator. Naturally such a capacitive filter has a frequency characteristic; when designing an oscillator for a wide frequency range, attenuation of the output voltage must be suffered at the high end to preserve the linearity at the low end. The linearity of the saw-tooth wave should be established at the low end of the desired range by inserting the minimum amount of capacitance necessary to produce linearity at that point, and unless this value is

gradually decreased with the frequency increase, attenuation in oscillation output voltage must be suffered. Also the type of saw-tooth waveform changes with the frequency and must be compensated over a frequency range by a feedback adjustment.

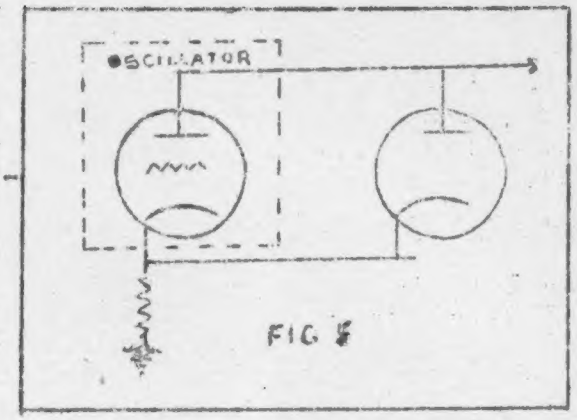


FIG 6

To obtain constancy of waveform and voltage output over a wide frequency range, a complex circuit control is necessary. When operating the oscillator over a limited frequency range, waveform and attenuation do not vary appreciably, and thus do not require compensation. Falling off in output voltage can be compensated by the use of an automatic amplitude control as shown in Figure 5. Best results are obtained by using voltage delay in the diode circuit so that oscillations must reach a certain level before amplitude control takes place. This may be accomplished by inserting a bias cell in series with the rectifier tube or by tapping the cathode return above ground on the power supply bleeder.

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The transitron can be used as a SELECTIVE AUDIO AMPLIFIER by varying the negative feedback through zero and to a slightly positive value, producing neutralization. Such action is accomplished by adjusting the feedback control to the point just below that for oscillation, and then using the control grid as a signal input, while taking the output from the screen grid. The only trouble with such a circuit is that the change in mutual conductance causes a change in selectivity, and the circuit hence does not possess equal qualities of inverse feedback circuits used for the same purpose. The effect is not too great at most audio frequencies, but increases as the upper part of the range is approached, and is of considerable magnitude at frequencies above the audio range.

Properly adjusted, PHASE SHIFT OSCILLATORS generate high-precision sine waves accurate to 0.1 per cent. The phase shifting network usually introduces so much attenuation that considerable amplification in the tube must exist to sustain oscillation. Proper filter design together with the use of high-u tubes will, however, produce favourable results from this type of oscillator. The use of fixed bias will facilitate the production of oscillation in some difficult cases. It may also be found necessary to include small bypass capacitors to prevent high frequency parasitics.

The variation of frequency in this oscillator does not make for easy construction since at least one constant in each section of the filter must be varied. An attempt to control the frequency over any appreciable frequency range, by variation of only one component in the circuit, would cause such attenuation in the filter circuit as to stop oscillations.

(continued on page 9)

POST-WAR RECONSTRUCTION

Last month we mentioned in FHQ report that a number of Service and civilian Hams held a Ham Fest at Albury, and had forwarded many ideas which had been discussed on that occasion. Here are their ideas.

STAFF OF WIA. Federal HQ to have at least President and Secretary on permanent staff. President to edit Magazine. Federal HQ to be located permanently in Melbourne, or where ever Chief RI's Office is located.

VIGILANCE COMMITTEE. - A Provost Committee to keep watch on all bands for Bum signals. If any one is caught using bum 'phone or T6 CW have him rubbed out for a month or so, depending on seriousness of offence. Similarly with unstable signals or any action unbecoming to a Ham and a gentleman...such committee to be responsible to Federal HQ and taken from the ranks of Hams who have proved themselves to be ideal Hams...Committee to work on a roster system.

VK2WI; VK3WI; ETC...To have a 500 watt permit and operate on edge of both domestic Bands (3, 5 and 7 Mc). The idea being to provide accurate frequency checks, and also to broadcast latest news from FHQ.

Each station to have accurate frequency meters, CRO's etc. and to provide Hams desiring modulation and frequency checks with such information when QSO-ing.

Assuming the B/C band is made available, WI stations to operate on this band, program being to provide the public with WIA activities as well as normal recorded items. Buckshee advertising for approved dealers in Ham gear.

EMERGENCY NETS...To be permanent, with WI Station acting as control regular practise of working such nets to be carried out.

WIA COMMITTEE DIVISIONAL ...Duration of office to be limited to 12 months. The idea being to do away with any cliques that may creep in. President and Secretary of FHQ to be from 5 to 8 years.

AFFILIATED CLUBS ...To work with, not against WIA. No limit to membership.

ZONE CONVENTIONS..To be held annually in a different town each year. WIA to pay expenses of at least one member from Divisional Committee.

MUSIC ... Banned on all bands below 112 Megacycles.

FREQUENCIES .. Same as submitted by ARRL to FCC. NO band to be divided into separate 'phone and CW channels..Phone and CW on all bands.

Appropriate frequencies to be allotted to FM, Pulse and similar transmissions.

EXAMINATIONS...CW speed to be 15 WPM. General standard of examinations to be stiffened. Those passing this exam to operate on CW only...Phone men to pass CW ticket first and then pass special phone exam. Holders of such tickets to operate any type of licenced transmission.

PROBATIONARY PERIOD...New comers to have to complete such period duration of which to be six months on reduced power (25 watts). At the end of the period log book to be submitted to FHQ for perusal and if satisfied that certain progress has been made, Log Book to be submitted with recommendation for full rights to be granted. New comers to operate either CW or 'phone (depending on ticket held) on passing Exam.

POWER INPUT...100 watts to final. The reason for request is that much equipment at present being used by armed forces is around 100 watts rating and would probably be available to Hams.

HAM GEAR ...Some attempt be made to have exise duty reduced. Duty and prices to be at least pre-war ZL level.

AGE LIMIT...To be raised to 18 years. Reason--to prevent over-enthusiastic youths neglecting their school studies.

POST WAR EXAMS ...Everyone to start from scratch and sit for tickets before licence is re-issued.

AIM OF W.I.A. - To have 100% Membership.

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TRANSITRON OSCILLATORS.

The phase shift oscillator is frequently sluggish in starting, and should always be allowed to stabilize after being set into operation. Since many tubes will not operate in this circuit, the 6SL7 is to be recommended. In addition to the excellence of wave-form produced by this oscillator, inherent difficulties, which arise in the conventional heterodyne audio type, such as poor beat-frequency stability due to high frequency drift, poor frequency synchronism a nd poor constancy of the calibration are overcome. The phase shift oscillator will operate from a fraction of a cycle per second throughout the audio range.

Best sine wave production is obtained where oscillations are barely sustained. Automatic amplitude control can be used.

In conclusion it should be noted that any feedback adjustment or other wave form control will cause a frequency shift, and the frequency control will, through its range, cause a wave form change. T hus a reference tow ave form or frequency control refers only to the major effect of the control upon the circuit. Thus in Figure 2, R1 is mainly a frequency control whereas R2 is mainly a feedback control.

SLOUCH HATS and FORAGE CAPS

Have you sent in your ideas for Post-war Australian Ham Radio yet? Federal Headquarters asked for them last month and I'll bet every one of you has discoursed long and loud on this subject many times since we were put off the air. Of course, no two of you agreed entirely, and just that fact makes it essential that you post your own ideas into FHQ. IF they get all our ideas they have a chance of getting what the majority want...but how they can do it, if you all leave it to mental telepathy, is quite beyond me...so get the old pen out and, "go to it."

And so, "Snow" 3MR is once more "seeing his DX," which this time involved taking part in that great march you all read about in the papers across what used to be the Third Reich. When one thinks of from North Africa, to Italy, to Poland, across Europe, to England... well, he should be now content to contact all his DX once more from that tall stick he had down in VK3. Air letters from both G6CL, and G2MI say he was "full of beans" as soon as he arrived in England... full enough anyway to contact RSGB HQ at once, and out seeing the sights of London a week later. So you had all better start looking for him on 14 mc. Hi! Good on you, Snow, om...don't forget an exclusive article for "A.R."

Incidentall Clarry 6CL mentions G6SN as arriving back after five years P.O.W., and in 6SN's camp there was a VK2...wonder who it was ...anybody have any ideas on the matter?

That lad VK2QL seems as though he will never get to where-ever it is he is going as he rang me up, yet again the other night from Sydney to know how a Proselector of two 1852's would go. And me a poor stay at civvie, who never saw an 1852 outside of the ARRL Handbook. Hi! Hope they send him out to 5KL's location. Hi!

I have reason to believe that VI3OF, CPO Tel Frank O'Dwyer has headed out to meet some DX, too. I wonder who is going to rebuild the Hen house after the next VK3 storm. VK6IG has left the ship and I believe is headed back to home territory, but a couple of the Sigs staff have brothers, Hams, so it apparently, is, "in the blood" so to speak.

Dave Hogan, VK2??? is a bit unique in that he passed his AOPC while on Active Service...wonder how many others have done this (2YC)...He is just gone on a spot of leave after 18 months in New Guinea...mostly around Madang. Whilst up there he met quite a few VKs including 9MT and 4HU, plus VK5's and VK6's. Asked regarding the other VK9's he said that he and 9MT were too busy "looking over some gear," but he didn't say whether in a service OR a Ham capacity... ..which makes all the difference, in the end, if you get what I mean.. Hi! MOST IMPORTANT, he says the Japs make an 807, so all yo Hams up North, look carefully, and hope strenuously they are not too typical of the HON quality (prewar) the Hon. country.

Fred Lubach 4RF still serves the Navy up at Townsville. He has now just about had twelve months there. As usual, so it seems, he is due for another trip to VIB to see the daughters. Hi! He also talks of starting on an II tube super....well, Fred, if you were here in Sydney you would stop right at the beginning...trying to get a chassis. He often sees Arthur 4AW, and Jim Rafter 4PR, while Arthur Burton, 4FE and Bill Aspiett 2ALT drop in for a ragchew.

On a beam to Magnetic Island, about 8 miles from Townsville, there is inscribed on a seat, the following calls....[illegible], VK4PR, VK3DX...(and now I suppose VK4RF, Hi!) There seems to be no impressions, don't there???

W/O Norm Foxcroft RAAF, VK3UQ tells us that they have a good muster-ing of Hams among the personnel at the Sigs School Point Cook Vic. VK3[illegible] and VK3[illegible] spent their time training telegraphists. [illegible] Alan Foxcroft now a Flight Lieut is in charge of Cathode Ray DF training; while VK3TY Bill Murden, a Squadron Leader no less is OC of Signal Officers School. On the staff of this Sig. Officers School is VK2WC F/Lt Cavanagh, VK5JT F/Lt Jas. Golley and myself VK3UQ W/O Foxcroft. Norm's comment about the gear is "It certainly makes your mouth water to see the half kw transmitter in the Laboratory and with a ting of remorse we think of the "lil old" 10 watter in mothballs for the duration.

Cfn M. D. Sidebottom, a member of the Victorian Division has been moved a bit closer home and may now be located with Vic L of C Workshops at Broadmeadows, from where he has hopes of being able to get along to the Divisional meetings.

In a letter to VK3NY, Sgt. Charlie Garver W8WFN who was a visitor to the last annual General Meeting of the Victorian Division writes, "I have been getting your WIA magazine promptly each month and enjoyed it thoroughly. But now I've left my ship and am living ashore here in [illegible], but my stay is only temporary. I'm on my way home for a nice long leave. When my leave expires, I expect to go to a replacement center for re-assignment. Of course I'll still be in radio but my sea-going days may be over."

Amongst a batch of new members recently admitted to the Vic Division were:- VK3EV S/Sgt Frank Walker of Camberwell who is now with 20 Aust Tech Maint. Sec. AIF somewhere in Australia; VK3MR Sgt. J.A. Cusick of South Melbourne is with a Heavy Wireless Group AIF not far from Melbourne; VK3EJ S/Sgt. Frank Fenham of Essendon is with an AIF [illegible] Detachment; VK3GX Col. P. R. Gibson of Camberwell with 1 Aust. Div. Sigs AIF; VK3FH F/O H.F. Huon with the RAAF somewhere in the Darwin area; VK3IO Lieut. A. L. Maguire of Stratford is with a Heavy A.A. Battery also somewhere in Australia; VK3IX Cpl. Gordon Daniel of Warracknabeal may be located at Group 417 RAAF Tocumwal and VK3ID Sgt. A.K. Carlyle of East Preston is with the RAAF somewhere in the Pacific area.

F/Lt George Glover VK3AG was on leave in Melbourne recently after having had quite a spell in the Darwin area and other parts reported that before going north he had contacted F/O Paul Watson VK3PY. George may now be located at No. 1 OTU East Sale.

(Continued on Page 16).

DIVISIONAL NOTES

- Federal Headquarters -

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This month we are pleased to announce that FHQ has made some progress in the direction of post-war planning. At the May council meeting of Federal Executive it was decided to proceed without delay with a draft plan for post war Amateur Radio. This plan was duly drawn up at a special meeting of FHQ held on May 2and, and represents only the ideas of the Federal Executive within the framework of the knowledge gained from our interview with the Chief Inspector. The draft plan should by now be in the hands of the Divisional Secretary's who are active. Where the Division has closed down a copy will be forwarded to the known contact in that state.

Suggestions for alteration will be welcome, in fact this is why the draft plan has been drawn up. These further suggestions will then be incorporated in a revised edition of the "PW Plan." This will then be re-circulated and the same procedure gone through again until the whole thing is built into a substantial design, complete in every detail.

This project does not, however, take the place of the scheme referred to in last months notes, namely the desire on our part for ideas from all members, rather the two are complementary. We still want to know what every Ham thinks so go to it.

Federal Executive would like to point out that in post-war planning there are two distinct plans. The first is that on which we are now working, and that is the approach to the PMG Department on conditions of licencing and regulations thereto. The Second is the actual workings within the W.I.A. framework, by that is meant the necessity of permanent officials etc., etc.

It seems your most humble commentator made a faux pas last month in those notes, mentioning the fact that N.S.W. had formed a Post-War Planning Committee and quite forgetting to point out that Victoria has had such a committee functioning for some time. Let the error be hereby corrected immediately lest the writer by chance encounter the VK3 Council some dark night.

Federal Executive decided at its May meeting to pay over the balance remaining in the Trust Account of Prisoner of War Fund, to the Australian Red Cross. This action was taken as the European Theatre of war had ended, and as far as it could be ascertained prisoners held there had been released. A choque for £28 was therefore forwarded to the Red Cross. In reply the Australian Red Cross desire Federal Executive to convey to those members who contributed to the fund their sincerest thanks, as the amount collected would help considerably in carrying out their work of mercy.

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NEW SOUTH WALES DIVISION

The May General Meeting of the Division was the first to be held at the new Headquarters Science House and despite the fact that the elements were very, very unkind, only one or two vacant seats could be observed. This augurs well for the future and if attendances continue to increase, consideration will have to be given to the taking over of the Main Hall.

The Chairman, in declaring the Meeting open, stated that he felt that he could not let the occasion pass without touching upon the significance of the May 1945 General Meeting. Firstly it was the first Meeting after V-E Day and that he would have a little to say later on in the evening regarding the effect of that great event on Experimental Radio. Secondly, this month marked the 35th Anniversary of the foundation of the Wireless Institute of Australia, another milestone in the history of the Institute and the fact that this meeting was taking place at Science House - the headquarters of all scientific bodies in New South Wales, was a noteworthy event.

Numbered amongst those present were VK2ABM, 2AJW, 2AGO, 2ADQ, 2DR, 2WN, 2JN, 2HZ, 2FN, 2DI, 2IE, 2NP, 2NG, 2LO, 2RA, 2TL, W6DJP, ex-VK3LK, CCY, 2AHJ. Messrs. Crocker, Chenhall, Davidson, Borlan, Mendel P/O Tel. Clark. IT IS HOPED THAT THE THREE MEMBERS OF THE COUNCIL WHO WERE NOT PRESENT, WILL BE IN A POSITION TO BE PRESENT AT THE JUNE MEETING!

A very interesting lecture was delivered by Mr. W. W. Honner B.Sc., B.E., A.M.I.E. who chose for his subject "The Effect of Atmospheric Conditions on Aircraft Radio Equipment." The subject matter was quite a departure from the usual trend of talks these days which deal mainly with the effects of heat and humidity. W.W.H. dealt mainly with temperature variations between ground level and 50,000 feet and the various astounding happenings that occur, particularly to Radio Equipment - to say nothing of human beings. The Lecturer was accorded a very hearty vote of thanks upon the conclusion of his talk.

Members were informed that Federal Headquarters were losing no time in making preparations for Post War Experimental Radio and had already had an interview with the Chief Radio Inspector. The Meeting was given brief details of certain proposals that the Divisional Council was submitting to F.H.Q. and after some discussion, the proposals were endorsed.

During the past two months, Members have had the opportunity of hearing lectures by outstanding speakers in their particular spheres. It must not be imagined that Experimental Radio and its present day problems have been overlooked. At the June General Meeting Mr. M. Lusby B.E., B.Sc. will give an outline of some types of equipment that should be available to Licensed Experimenters after the war, together with details of some operating techniques. 2WN is well qualified to speak on this subject and from his talk and the discussion that will most certainly ensue it is hoped to place some tangible programme before the manufacturers. This lecture will be of importance to every holder, and prospective holder of an AOCP, and it will be in your own interest to be present.

Don't forget, the June General Meeting will be held on Thursday 21st June at Science House, commencing at 8 pm, and it will be advisable to come early if you are to obtain a seat.

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SYDNEY HARBOR PATROL

Details were given in the May issue of the magazine regarding the part to be played by this organisation during V-E Day Celebrations. As prophet predicted the Day has come and gone and we are now waiting for V. P Day.

Unfortunately (?) VE Day and the night preceding same passed off very quietly. It can be said with certainty that on the day we see the 8th Division swinging down Martin Place, Sydney will show the rest of the world how to really celebrate. That is by the by, of course.

Here are details of VE day as the Experimenters saw it. Sharp at 7 p.m, Central was manned and at 7.05 p.m "Pert" was the first boat to check in. The Radio set up at the Control station was as follows:- Four Receivers and one transmitter were in use. The Receivers were tuned as follows - No. 1 National Station. No. 2 Police Transmitter. No. 3 Harbor Patrol (E.C.N. Wavelength). No. 4 Harbor Patrol, Shore Patrol and Police Cars. The Transmitter operating on the E.C.N. Wavelength.

At 8 p.m. launch "Pert" intimated that she was now leaving "Sea Horse" for her allotted Patrol area, and during the evening until 1 a.m. reports continued to be exchanged. We are very sorry that "secrecy of Correspondence" debars us from telling a few stories regarding the night's happening as heard per medium of the various Receivers!

At 1.10 a.m, Central closed down and a few weary hams wended their way home (I hope) regretting that Sydney must be getting a very quiet place like Melbourne, but happy in the knowledge that if they had been called upon they would not have been found wanting.

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- E.C.N. DOINGS -

Exercises are still carried out on the first Friday in the month and May practice saw all stations manned. Those E.C.N. Operators who are not rostered for duty on any Practice night should make a point of listening to the messages passed from Control to the outlying stations as these days, they are usually made of interesting items concerning the Institute.

After an absence of many moons 2NP graced Control with his presence recently. It was too much for the transmitter. The relays just wouldn't work. It was a sight for sore eyes to see a wellknown Radar operator sitting on the floor holding the contacts down, Tom's version of it was "Well, I feel more at home, anyway," spoken like a real ham!

BUSHFIRES NETWORK

On Sunday May 13th Dubbo Network had a Field Day, and they report Tests quite satisfactory, in fact they were able to contact VL2EE-ta Young - on the Trusck Set in broad daylight. Signals at both ends were R7 to R8.

Quite a lot was learnt from the field day, quite a number of faults showing up, particularly with reference to the portables, insofar as they were not "sufficiently portable," the battery supply being the main problem.

At the present time the portable sets are forced to use Superdynes as a source of power and it can be quite easily understood that carrying this type of battery around the country is no easy job. It is hoped that in the very near future when Service demands slacken, it will be possible to have made available a lighter type of "B" battery.

In the meantime Section Leader Max Moore intends equipping the portables with a small vibrator and a very small 6 volt motor cycle battery. He feels that the saving in cost would be tremendous and the saving in space quite worth while. Of course hash at the receiving end may be difficult, and then again vibrators are not readily available.

There is no news from Young this month, but this is understandable as the operators down there are busy moving stock northwards to more favorable areas.

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VICTORIAN DIVISION

Members are reminded that on Tuesday June 5th, that's the day you should receive this magazine, is Meeting night. Publicity in last month's magazine tells that Harry Kinnear VK3HN will be putting on a movie show, and as far as known, the features published still hold good. They are "The Cathode Ray Oscilloscope" and "Thermionic Tubes", both of which should prove of very much value to every Ham. The show will be completed with one or two topical shorts. Everyone is welcome to attend, so roll up and make a good mustering.

Membership of the Victorian Division still shows a remarkable increase, due mainly to the work of the Membership Secretaries At the present moment the total is very close on 250, a figure which is as high if not higher than it ever has been. Members can help swell the number by introducing non-members, and others interested in Radio. Drop a line to your Divisional Secretary.

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It seems that your Notes Correspondent only has to say one word out of place to be taken to task. The Laboratory Committee have passed in another report so to save any further recriminations here it is as written. "Lack of space precludes comment on the Editor's preface to last month's report (I'm looking for copy to fill up this month...Ed.) He'd probably censor it, anyway and we have more worthwhile news to impart.

At last we can report some concrete progress in the rehabilitation of the library. Six modern technical radio books, to wit... Meter at Work..Rider; Basic Radio...Hoag; Radio Receiver Design.. Sturley; Hyper and Ultra High Frequency Engineering...Sarbacher and Edson; Time Bases...Puckle; Radiotron Designers Handbook...AWA: have been purchased and will be available for loan to members shortly. In addition subscriptions have been made to "Wireless Engineer" and Communications." This very modest beginning has been made possible by the use of funds secured by the sale of some Admiralty Handbooks, 1938 Edition. In order to secure more funds so that we may enlarge the library, ten copies only of the Admiralty Handbook 1931 edition are offered for sale at five shillings each.

And now to end up, the next meeting of the Division will be held on Tuesday 5th June at the Rooms, 6th floor, 191 Queen Street, and the evening will be taken up with a Technical movie show put on by Harry Kinnear....everyone is welcome.

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SLOUCH HATS AND FORAGE CAPS.

Constant readers of this page will recall that early this year we announced the double event in 3NY's family. A prediction was made in respect to the announcement of the engagement of Clem Day VK3GY, RAAF to NY's sister...well. it didn't take very long because about a month ago Clem did a knee tremble waiting at the end of the "issel." After spending a honeymoon at Lakes Entrance, Clem is back at work...he must know someone, because he managed to get posted back to Essendon.

Heard of a very sad case the other day. A couple of very active pre-war Hams have since married, and their wives do not take very kindly to the idea that "a Home is a place where Ham Radio is carried on, with spells in between contests when Pop can mind the baby etc." These poor ladies think Ham Radio is the subsidiary affair. As they have said so quite loud and often, these rightly alarmed Hams request support and an organisation where all Wartime Wives be taught to "see the light," Hi!....YL, please note....

Now, look here, would some of you "seeing Dx" Hams remember you all have to knock off looking in their eyes to send in your notes to YOUR column...you all get lazier and lazier...or is it only the old cry "vy yl QRM" Hi! In any case send your notes at once to the divisional Secretary or to VK2YC...78 Maloney Street, Eastlakes (Mascot), Phone MU1092.